To Marjorie Easton, OSC 9/1/92
K. Sivaraja, PADoH 9/2/92

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Agency for Toxic Substances and Disease Registry

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REGION III

Memorandum

Date August 12, 1992

From Senior Toxicologist, TSS, ERCB, DHAC (E32)

Subject Health Consultation: Kovalchick Salvage Yard (CR# 03#PA)
Indiana, Pennsylvania

To Jack Kelly
ATSDR Regional Representative
ATSDR Region III
Through: Director, DHAC, ATSDR (E32)
Chief, ERCB, DHAC (E32)
Chief, TSS, ERCB, DHAC (E32)

BACKGROUND AND STATEMENT OF ISSUES

The Region III, U.S. Environmental Protection Agency (EPA) asked the Agency for Toxic Substances and Disease Registry (ATSDR) to evaluate potential health hazards related to the Kovalchick Salvage Yard site in Indiana, Pennsylvania [1]. The documents submitted for ATSDR's review included the Preliminary Assessment [2], the Site Inspection [3], and the Sampling Plan [4] for the site.

The site is an active, privately owned business that buys and sells new and recycled metals and railroad materials [2]. The business deals primarily (but not exclusively) in iron and steel. The site occupies about 24-acres, and much of the property is covered with steel rails, stacks of railroad ties, and various types of metal stock and scrap [2]. On-site inspections have reported the presence of empty drums, lead acid batteries, transformers, and transformer casings [2,3]. It was reported to ATSDR that the transformers have recently been removed from the site and disposed of in accordance with Toxic Substance Control Act (TSCA) regulations [5].

The site is adjacent to Indiana University of Pennsylvania, as well as other residential, commercial, and industrial properties [2]. The only fenced areas are the scrap storage building and two on-site natural gas wells; access to the rest of the site is unrestricted [2]. Public streets transect the site, and two perennial streams flow through the site and merge to form Stoney Run. Stoney Run and its receiving stream, Two Lick Creek, are protected for trout and other flora and fauna.

Eight on-site soil samples (unspecified depth) were collected and analyzed for metals, polychlorinated biphenyls (PCBs), and

organochlorine pesticides [4]. Three of the samples were composite samples, and five were discrete grab samples. The maximum lead concentration detected in a soil grab sample was 26,100 parts per million (ppm), and in a composite soil sample, 723 ppm [1].

The maximum detected PCB concentration detected in a soil sample was 730,000 ppm (as Aroclor 1260) [1]. Since this concentration is equivalent to 73% PCBs by weight, the sample was apparently collected in a PCB spill area. In the remaining soil samples, the maximum PCB concentration was 6.9 ppm.

DISCUSSION

Excessive lead exposures in adults can cause adverse neurological effects, chronic nephropathy, impaired hemoglobin synthesis, and a decrease in sperm cell counts and motility [6]. In adults, these effects are generally associated with blood lead levels in excess of 40-50 micrograms/deciliter (ug/dl). It has also been reported that exposure to lead may contribute to hypertension, particularly in adult men. Although hypertension is a multi-factorial disease, large-scale population studies have demonstrated a positive association between blood lead levels and systolic blood pressure in middle-aged men at blood lead levels as low as 7 ug/dl.

Children and developing fetuses are susceptible populations for lead toxicity [6]. The developing nervous system of a fetus or young child is particularly sensitive to the neurotoxic effects of lead. Adverse neurological effects in children have been associated with blood lead levels as low as 10 ug/dl [6]. Therefore, special precautions should be taken to ensure that children and women of child-bearing age are not exposed to lead contamination.

Epidemiological studies have indicated that occupational exposures to PCBs may produce elevations in liver enzymes, although the changes may not be clinically significant [7]. PCB exposures in humans have also been associated with chloracne, but the dose-response relationship for this effect has not been determined. There is also some evidence that PCBs may have developmental or fetotoxic effects in pregnant women. Animal studies have indicated that PCBs may be carcinogens, although a carcinogenic effect in humans has not been unequivocally established [7].

High concentrations of lead (up to 26,100 ppm) were detected in soil samples collected from several on-site locations. In addition, a composite soil sample collected from the northeast section of the site also contained an elevated soil lead concentration (723 ppm). Therefore, lead contamination appears to be spread across several areas of the site. One "hot spot" of PCB contamination (730,000 ppm) was detected on-site. No other PCB soil concentration in excess of 6.9 ppm was detected.

Except for a few fenced areas, access to the site is generally unrestricted. Workers could be expected to have frequent contact with contaminated areas, and it is also possible that trespassers from the adjacent university and apartment buildings could have occasional contact with contaminated on-site areas.

Workers at the site could inadvertently ingest small amounts of contaminated soil during eating, smoking, and other hand to mouth activities. In addition, on-site work activities could generate contaminated dust, which could be inhaled. There was no indication that on-site workers are provided with any protective clothing. Therefore, skin contact with PCB-contaminated soil could result in dermal absorption of small amounts of PCBs. Workers could also carry contaminants home on their work clothes, which could result in exposures for other family members. Trespassers on the site could ingest or inhale contaminated soil or dust, but their exposures would be expected to be much less frequent than those of workers.

Surface water runoff from the site could carry soil-bound contaminants into the two surface streams that cross the site. PCBs pose the greatest concern for contamination of surface bodies of water because of their great capacity for bioaccumulation in fish and other aquatic animals [7]. (It was reported that trout inhabit streams located downstream from the site.) However, there are no data to indicate whether PCBs are present in the on-site streams.

CONCLUSIONS

Based on the information reviewed, ATSDR concludes the following:

1. On-site contamination with lead and PCBs poses a potential health threat for on-site workers.

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2. Off-site populations have access to contaminated on-site areas and to equipment and debris that pose a risk of physical injury.

3. No off-site environmental sampling and analyses have been conducted. Therefore, it can not be determined if there is any off-site contamination that poses a potential public health threat.

RECOMMENDATIONS

1. Protect on-site workers from exposures to contaminated soil and dust.

2. Restrict public access to contaminated on-site areas and to areas with physical hazards.

3. Implement measures to prevent off-site transport of contaminants by dust generation or by surface water runoff into streams and other contiguous off-site areas.

4. Collect off-site surface soil samples from nearby residential areas and other public access areas and analyze for site-related contaminants. Assess for public health implications if significant levels of off-site contamination are detected.

If further clarification is necessary or if additional data become available, please contact this office at 404-639-0616.

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cc: NIOSH

REFERENCES

(1) Memorandum and data package to Charles J. Walters, ATSDR Regional Representative, from Marjorie Easton, OSC, EPA Region III, November 19, 1991.

(2) NUS Corporation, Preliminary Assessment of Kovalchick Salvage Yard, July 10, 1990.

(3) NUS Corporation, Site Inspection of Kovalchick Salvage Yard, May 23, 1991.

(4) Charles W. Fisher, Sampling Plan: Kovalchick Salvage Yard, April 22, 1991.

(5) Scott McPhilliamy, EPA to Jack Kelly, ATSDR, ATSDR Record of Activity, May 2, 1992.

(6) ATSDR, Draft Toxicological Profile for Lead, October 1991.

(7) ATSDR, Draft Toxicological Profile for Selected PCBs, October 1991.